5/14/98-01212

MEMORANDUM CH2MHILL

Addendum to the SAP for Additional Field Activities for CTO 45

TO: Randy Jackson/LANTDIV

COPIES: Mike Tilchin/CH2M HILL
James Hutton/CH2M HILL
Richard Doucette/CH2M HILL

FROM: Bob Root/CH2M HILL

DATE: May 14, 1998

Randy

Attached are two copies of the addendum to the Sampling and Analysis Plan (dated November 17, 1997) for CTO 45 to cover the upcoming field activities. The tables and figures have been numbered sequentially with those in the November 17, 1997, version to distinguish them.

There will be three additions to the addendum in the near future:

- Figures FSP-7 and FSP-8 will be revised to show the locations of the direct-push investigations.
- Figure FSP-10, which shows the locations of the monitoring wells to be sampled, will be added.
- Table FSP-8, which has the sample designations for the upcoming groundwater sampling, will be added.

I will send these items as soon as they have been completed.

Please call with any questions.

Bob

Addendum to

Sampling and Analysis Plan Long-Term Monitoring at Four Sites: Camp Allen Landfill, CD Landfill, Q Area Drum Storage Yard, and LP-20 Site

(NO FINAL DOCUMENT AVAILABLE)

Naval Base Norfolk
Norfolk, Virginia

Contract Task Order 0045

November 10, 1997

(Addendum May 14, 1998)

Prepared for

Department of the Navy
Atlantic Division
Naval Facilities Engineering Command

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Prepared by

CH2M HILL

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Introduction

This is an addendum to the Sampling and Analysis Plan (SAP) dated November 10, 1997, that covers completed CTO-45 sampling activities for the long-term monitoring plans at four sites at Naval Base Norfolk (NBN), Norfolk, Virginia. The addendum documents procedures and practices to be followed during additional CTO-45 sampling activities, which comprise:

- Direct-push groundwater sampling, monitoring-well and piezometer installation, and monitoring-well sampling at the Camp Allen Landfill
- Monitoring-well installation and monitoring-well sampling at Q Area Drum Storage Yard

The SAP also documents the site-specific quality assurance (QA) and quality control (QC) procedures to be used during the above-mentioned field activities and the site-specific details of investigation-derived waste (IDW) management and health and safety.

The site-specific SAP and the addendum are to be used in conjunction with the NBN Master Sampling and Analysis Plan (MSAP) contained within the final Master Project Plan (MP) produced by CH2M HILL in October 1997. The MSAP should be referenced for all general information, such as background information, sampling and analytical methodologies, and standard operating procedures (SOPs).

Field Sampling Plan

This Field Sampling Plan (FSP) documents site-specific procedures and practices to be followed during additional CTO-45 field activities. The locations of the four sites investigated under CTO-45 are shown in Figure FSP-1. The FSP is to be used in conjunction with the NBN Master Field Sampling Plan (MFSP) contained within the final Master Project Plan (MP) produced by CH2M HILL in October 1997. The MP should be referenced for general information concerning practices and procedures followed during all monitoring activities.

The original version of the FSP (November 10, 1997) contains a summary of all CTO-45 sampling activities through February 1998. Details specific to additional work at two of the four sites (Camp Allen Landfill and Q Area Drum Storage Yard) and a summary of all additional CTO-45 field activities are included in this FSP. A site-specific checklist of information that is specific to CTO-45 and not found in the MSAP is located at the end of this section.

Site-Specific Sampling Programs

The field programs for the two sites are discussed below. All field activities will be performed in accordance with the appropriate standard operating procedures (SOPs) located in Volume 2 of the MP. If the proposed sampling procedures vary from the SOP found in the MP, the variation will be noted and the new procedure described below. All referenced SOPs are listed on the site-specific FSP checklist at the end of this section.

Camp Allen Landfill

Monitoring-Well and Piezometer Installation

Several monitoring wells and piezometers are planned for Camp Allen Landfill. Figures FSP-7 and FSP-8 show the proposed monitoring-well and piezometer locations. The following wells and piezometers will be installed:

- Two surface-cased deep monitoring wells and three surface-cased deep piezometers in Area A and Area B to be used to provide additional information on the extent of contamination and the directions of groundwater flow in the Yorktown aquifer. The wells and piezometers will be constructed by installing surface casings of PVC to an estimated depth of 50 feet with hollow-stem auger drilling and installing monitoring wells and piezometers within the surface casings to a depth estimated at 70 feet with mud-rotary drilling. The wells and piezometers will be constructed of 2-inch PVC riser and screen.

- Two shallow piezometers in Area B to be used to provide additional information on the directions of groundwater flow in the shallow aquifer. The piezometers will be constructed with hollow-stem auger drilling to a depth estimated at 30 feet of 2-inch PVC riser and screen.

- Two shallow monitoring wells in Area A and Area B to be installed based upon the data collected during the direct-push investigation, as described above. The wells will be

constructed with hollow-stem auger drilling to a depth estimated at 30 feet of 2-inch PVC riser and screen.

Soil and drilling mud will be placed in a roll-off container and drums and tested for RCRA characteristics, then disposed of off the site, presumably as a non-hazardous waste. Water from development and decontamination will be disposed of at the Camp Allen Landfill groundwater-treatment facility, if available; otherwise it will be contained in tanks, tested, and disposed of properly. Further details on the handling of IDW are provided in the IDW management plan.

Sampling of Monitoring Wells

The following groundwater sampling will be performed:

- Two new deep monitoring wells (both in Area A) for low-concentration VOCs and total and dissolved TAL inorganics.
- Two new shallow monitoring wells (in Area A and Area B) for low-concentration VOCs only.
- An estimated 14 existing monitoring wells (12 deep and 2 shallow) for low-concentration VOCs only.

Table FSP-6 summarizes the field program for future work at CTO-45 and the sampling and analyses to be performed. The locations of the wells to be sampled are shown in Figure FSP-10.

Water from purging will be disposed of at the Camp Allen Landfill groundwater-treatment facility, if available; otherwise it will be contained in tanks, tested, and disposed of properly. Further details on the handling of IDW are provided in the IDW management plan.

Direct-Push Groundwater Sampling

High levels of trichloroethene (TCE) and vinyl chloride (VC) have been detected in many wells at Camp Allen Landfill. Direct-push groundwater sampling was performed in April 1998 in the vicinity of well A2-MW11A to determine the areal extent of the contamination and in the vicinity of wells MW-15B and MW-16 to determine the areal extent and the likely source of the contamination. The locations of the direct-push investigations are shown in figures FSP-7 and FSP-8.

Thirty groundwater samples, 17 from Area A and 13 from Area B, were collected using direct-push techniques. The depth to groundwater at well A2-MW11A is estimated to be about 10 feet and at B-MW15A and B-MW16 is estimated to be about 2 to 3 feet. Appropriate QC samples also were collected. The samples were submitted to a fixed laboratory for analysis for VOCs with 14-day turnaround time. The direct-push data were used to site the shallow monitoring wells in Area A and Area B for confirmation groundwater sampling.

IDW consisted only of decontamination fluids and was disposed of at the Camp Allen Landfill groundwater-treatment facility.

Q Area Drum Storage Yard

Monitoring-Well Installation

One shallow well will be installed in the area. The location is south of the AOC 2 contaminant plume to better define the nature and extent of contamination at a location where

Hydropunch® sampling detected elevated levels of organic compounds. Figure FSP-9 shows the proposed well location. The well will be constructed to a depth estimated at 30 feet of 2-inch PVC riser and screen.

Soil and drilling mud will be drummed. Testing results from earlier investigations at Q Area will be used to classify the soil for degree of hazard. Water from development and decontamination will be drummed and disposed of at the LP-20 industrial wastewater treatment facility. Further details on the handling of IDW are provided in the IDW management plan.

Sampling of Monitoring Wells

The new shallow well and an existing shallow well (within the ring of air-sparging wells) will be sampled for low-concentration VOCs and geochemical parameters needed to evaluate whether or not natural attenuation is occurring.

Water from purging will be drummed and disposed of at the LP-20 industrial waste-water treatment facility. Further details on the handling of IDW are provided in the IDW management plan.

Sample Designation

Each field sample will be designated with an alphanumeric code that will uniquely identify the sample. The sample designations used for past sampling are listed in tables FSP-3, FSP-4, and FSP5 of the SAP dated November 10, 1997. The sample designations for direct-push samples are provided in Table FSP-7. The sample designations for upcoming sampling at Camp Allen Landfill and Q Area currently are provided in Table FSP-8.

Site-Specific Field Sampling Plan Checklist

This checklist supplements the Master Field Sampling Plan with site-specific information. Once completed for a specific project, it provides necessary field sampling information for each investigation. It is to be taken into the field with the MFSP.

Sites: Camp Allen Landfill, and Q Area Drum Storage Yard

1. Tasks to be performed:

____ Geophysical surveys	X ____ Groundwater sampling
____ Soil gas surveys	X ____ In-situ groundwater sampling
____ Surface-water sampling	____ Aquifer testing
____ Sediment sampling	X ____ Hydrogeologic measurements
____ Surface-soil sampling	____ Biota sampling
____ Soil boring installation	____ Trenching
____ Subsurface-soil sampling	X ____ Land surveying
X ____ Monitoring-well installation and development	X ____ Investigation derived waste sampling
	X ____ Decontamination
____ Well abandonment	____ Other ____

2. Field measurements to be taken:

X ____ temperature	X ____ surveying
X ____ pH	____ magnetometry
X ____ dissolved oxygen	X ____ global positioning system
____ turbidity	____ soil gas parameters (list):
X ____ specific conductance	____ combustible gases
X ____ organic vapor monitoring	X ____ water-level measurements
____ geophysical parameters (list):	____ pumping rate
____ electromagnetic induction	____ other ____
____ ground-penetrating radar	

3. Sampling program (nomenclature, etc.):

As per Section 3.1 of Master FSP X ____ Other See Table FSP-6

4. Maps of boring and sampling locations: See figures FSP-7 through FSP-9.

5. Table of field samples to be collected: See tables FSP-7 and FSP-8.

6. Applicable SOPs. Copies are provided in the MP, Volume II:

Field Parameters:

Field Measurement of pH
Field Measurement of Specific Conductance and Temperature

Field Measurement of Dissolved Oxygen

Health and Safety Monitoring:

Volatiles Monitoring with an OVA

Field Measurements of Organic Vapors

Operation of Drager Gas Detector

Using an HNU

CGI/Oxygen Meter

Explosimeter

Monitoring-Well Drilling and Installation

Installation of Shallow Monitoring Wells

General Guidance for Monitoring Well Installation

Groundwater Sampling:

Groundwater Sampling from Monitoring Wells

Sample Preparation :

VOC Sampling - Water

Field filtering

Packaging and Shipping Procedures

Decontamination and Waste Management:

Decontamination of Personnel and Equipment

7. Site-specific procedures or updates to protocols established in the Master FSP: See text in the site-specific Field Sampling Plan.

Table FSP-6

GROUNDWATER SAMPLING PROGRAM

Sampling Location	Site/Media	TCL VOCS	Total and Dissolved TAL Metals	Nitrate, Sulfate, Sulfide, Chloride, and TOC
18 monitoring wells	Camp Allen Landfill Groundwater	X	X	
30 direct-push locations	Camp Allen Landfill Groundwater	X		
2 monitoring wells	Q Area Groundwater	X		X

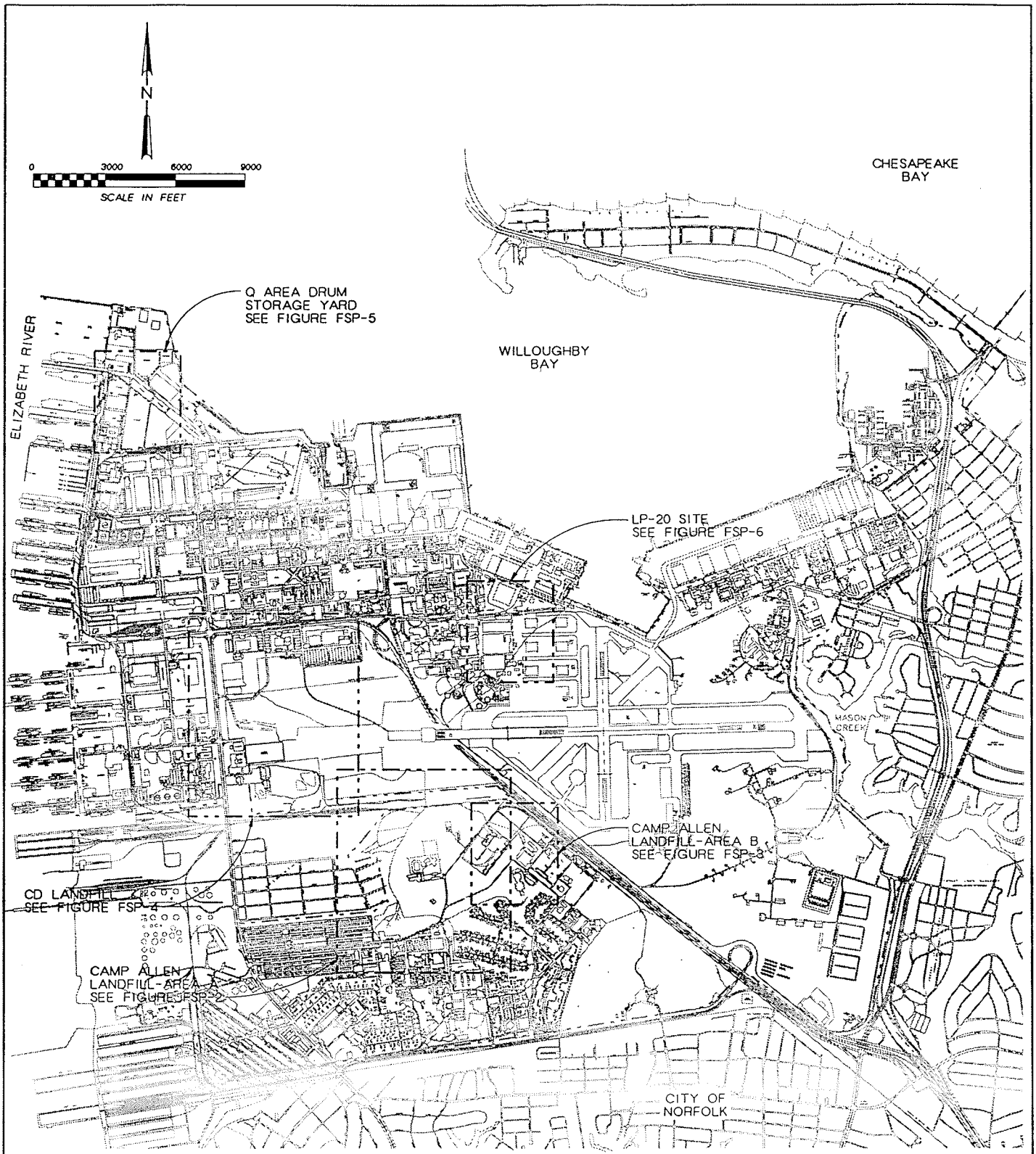
TCL = Target Compound List, VOCs = Volatile organic compounds
TAL = Target Analyte List
TOC = Total organic carbon

Table FSP-7
DIRECT-PUSH CAMP ALLEN LANDFILL
SAMPLE DESIGNATIONS

SAMPLE LOCATION	SAMPLE ID
Locations to be determined	NBS01-DW1A
using GPS	NBS01-DW1A42898
	NBS01-DW2A
	NBS01-DW3A
	NBS01-DW4A
	NBS01-DW5A
	NBS01-DW6A
	NBS01-DW7A
	NBS01-DW8A
	NBS01-DW9A
	NBS01-DW10A
	NBS01-DW11A
	NBS01-DW2A42998
	NBS01-DW12A
	NBS01-DW13A
	NBS01-DW3A42998
	NBS01-DW4A42998
	NBS01-DW14A
	NBS01-DW15A
	NBS01-DW16A
	NBS01-DW17A
Locations to be determined	NBS01-DW1B
using GPS	NBS01-DW1B42898
	NBS01-DW2B
	NBS01-DW3B
	NBS01-DW4B
	NBS01-DW5B
	NBS01-DW2B42898
	NBS01-DW6B
	NBS01-DW7B
	NBS01-DW3B42898
	NBS01-DW4B42898
	NBS01-DW8B
	NBS01-DW9B
	NBS01-DW10B
	NBS01-DW11B
	NBS01-DW12B
	NBS01-DW5B42898
	NBS01-DW13B
	NBS01-DW6B42898
	NBS01-DW7B42898
	NBS01-DW8B42898

Table FSP-8
CAMP ALLEN LANDFILL AND Q AREA MONITORING
SAMPLE DESIGNATIONS

SAMPLE LOCATION	SAMPLE ID
Locations to be determined	Sample ID to be determined



LEGEND

— - - — - · *PROPERTY BOUNDARY - NORFOLK NAVAL BASE*

Figure FSP-1
SITE LOCATION MAP
Long-Term Monitoring Program
Naval Base, Norfolk

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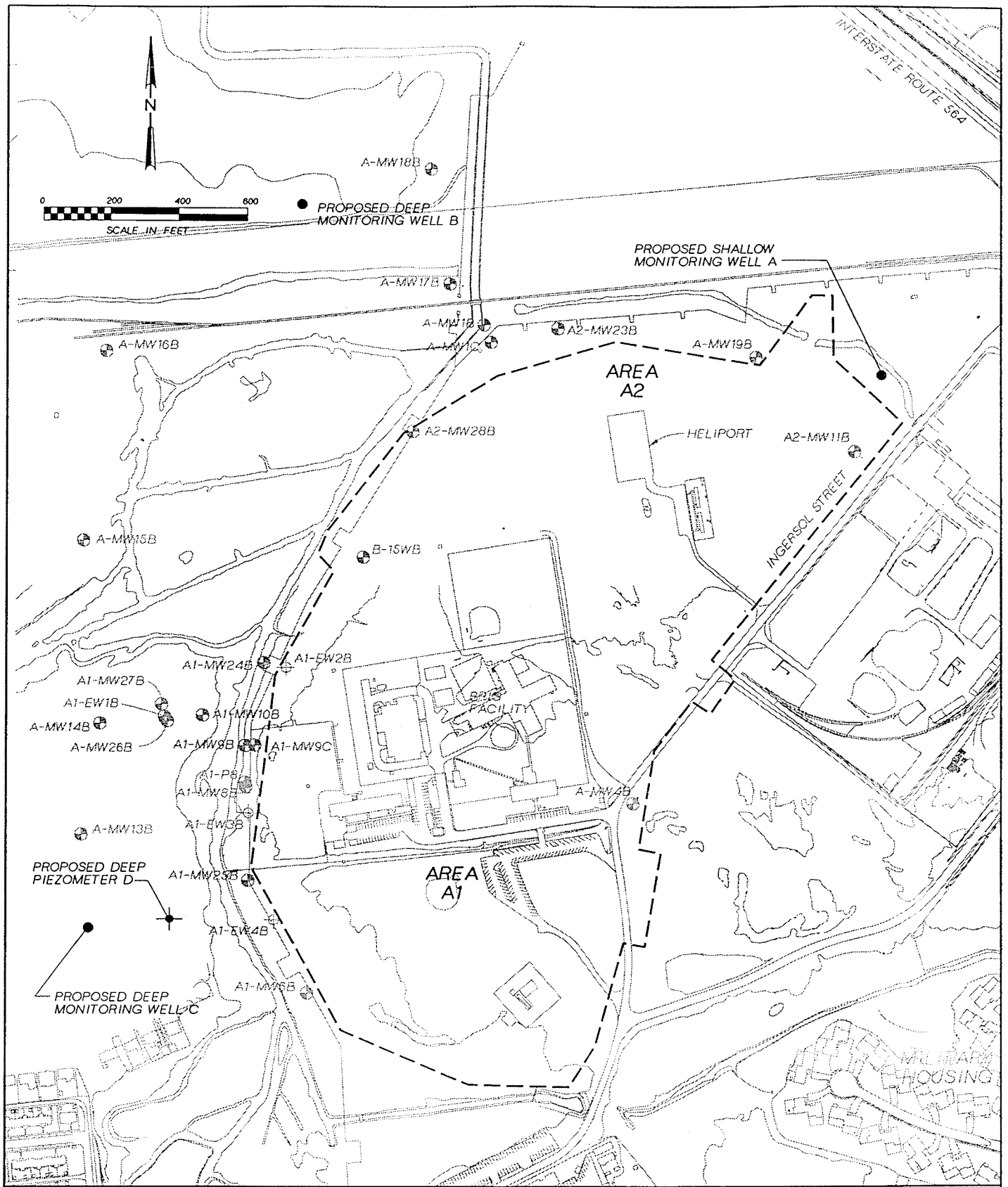
07-NOV-1997 20651001.dlv



LEGEND

- A1-MW16B — DEEP MONITORING WELL LOCATION TO BE SAMPLED
- PROPOSED MONITORING WELL
- PROPOSED PIEZOMETER
- A1-MW6B — DEEP MONITORING WELL LOCATION
- A1-EW2B — DEEP EXTRACTION WELL
- AREA A BOUNDARY LINE

Figure FSP-7
PROPOSED MONITORING WELLS AND PIEZOMETER - AREA A
CAMP ALLEN LANDFILL
Naval Base Norfolk
Norfolk, Virginia

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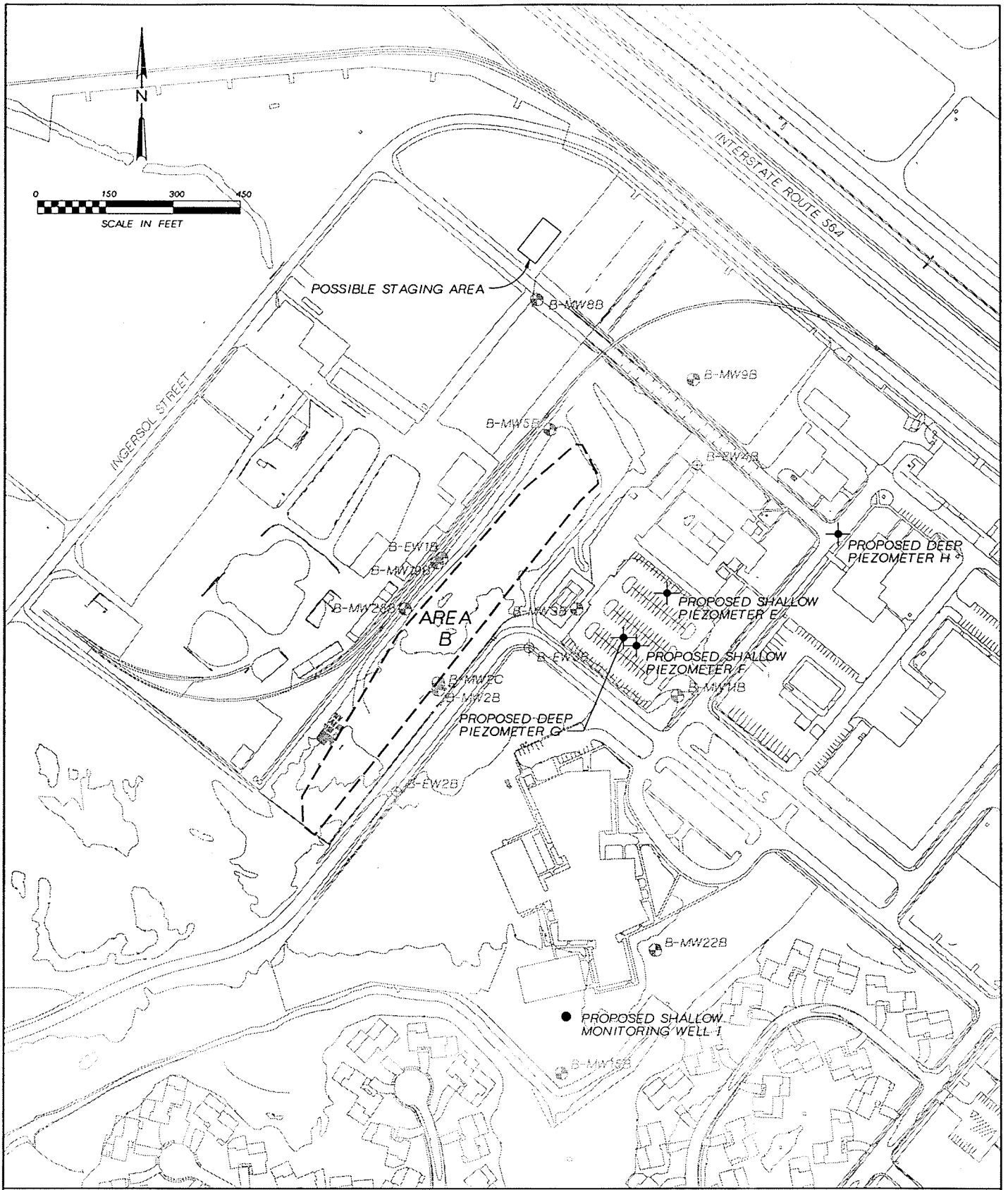
14-MAY-1998 20651045.dlv



LEGEND

- B-MW15B — DEEP MONITORING WELL LOCATION TO BE SAMPLED
- PROPOSED MONITORING WELL
- PROPOSED PIEZOMETER
- B-MW22B — DEEP MONITORING WELL LOCATION
- B-EW2B — DEEP EXTRACTION WELL
- AREA A BOUNDARY LINE

Figure FSP-8
PROPOSED MONITORING WELL AND PIEZOMETERS - AREA B
CAMP ALLEN LANDFILL
Naval Base Norfolk
Norfolk, Virginia

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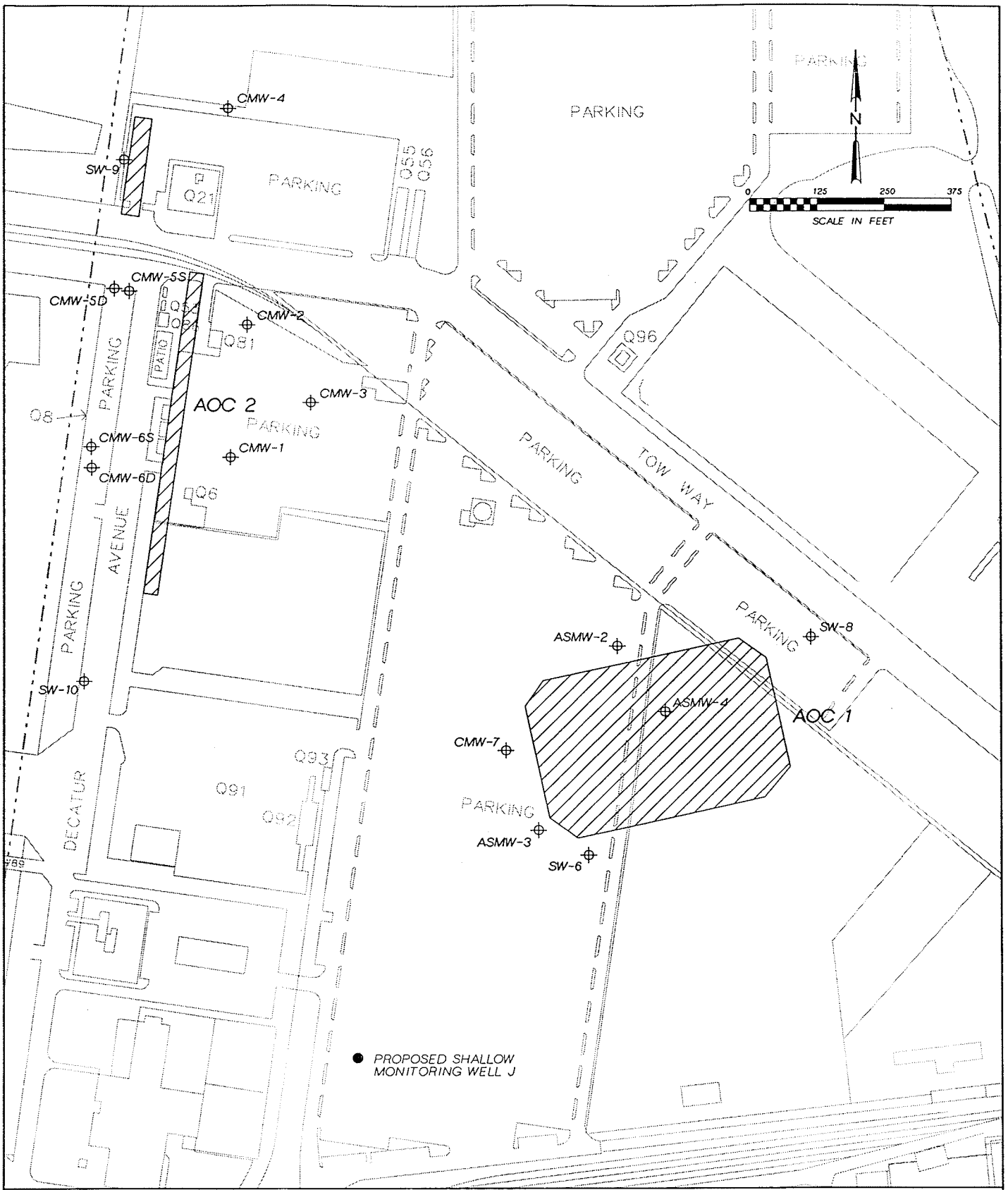
14-MAY-1998 2065f046.dlv



LEGEND

- MONITORING WELL SAMPLED
- PROPOSED MONITORING WELL
- APPROXIMATE AREA CONTAINING AIR-SPARGING AND SOIL-VAPOR EXTRACTION WELLS
- PROPERTY BOUNDARY - NORFOLK NAVAL BASE

Figure FSP-9
PROPOSED MONITORING WELL
Q AREA DRUM STORAGE YARD
Naval Base Norfolk
Norfolk, Virginia

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14-MAY-1998 20651047.dlv

Quality Assurance Project Plan

This Quality Assurance Project Plan (QAPP) documents site-specific quality assurance (QA) and quality control (QC) procedures to be used during CTO-45 sampling activities, which include direct-push groundwater sampling, monitoring well installation, and sampling and piezometer installation at the Camp Allen Landfill and the Q Area Drum Storage Yard at Naval Base Norfolk (NBN), Norfolk, Virginia. The QAPP is written to be used in conjunction with the NBN Master QAPP (MQAPP) contained within the draft final Master Project Plan (MP) produced by CH2M HILL in October 1997. The MQAPP should be referenced for information concerning general QA/QC procedures, analytical methodologies, and sample handling. The site-specific checklist of information that is specific to CTO-45 and that is not found in the MQAPP is located at the end of this section.

Site Specific Quality Assurance/Quality Control

All sampling activities will be performed in accordance with the MQAPP and the appropriate standard operating procedures (SOPs) located in Volume II of the MPP. If the proposed sampling procedures vary from the MQAPP or the SOPs found in the MPP, the variation is noted and the new procedure is described in the site-specific FSP. All referenced SOPs are listed on the checklist at the end of the site-specific FSP.

All sample analyses will be performed in accordance with standard EPA methods and procedures by a contracted laboratory that fulfills all requirements of the U.S. Navy's QA/QC Program Manual and EPA's Contract Laboratory Program (CLP). A signed case narrative of analysis will be provided with each laboratory analysis certifying that all work was performed in accordance with the terms and conditions of the contract. All analyses will be performed following the Navy's guidance for the highest level of data quality. Tables QAPP-6 and QAPP-7 give a summary of the samples to be submitted from upcoming sampling for laboratory analyses, including QA/QC samples. A summary of samples previously submitted to the laboratory was included in the SAP dated November 10, 1997.

Site-Specific Quality Assurance Project Plan Checklist

This checklist supplements the M QAPP with site-specific information. Once completed for a specific project, it provides necessary quality assurance information for each investigation. It is to be taken into the field with the MQAPP.

Site: Camp Allen Landfill and Q Area Drum Storage Yard

1. List sampling tasks: Groundwater sampling at both sites.

2. List data quality objectives:

Camp Allen Landfill - Groundwater samples have been collected to assess the initial concentrations of groundwater contamination in the extraction wells so that the reduction of the concentrations of contaminants over time in the extraction wells can be monitored. Samples will be collected to provide supplemental information from existing and new monitoring wells. Water levels will be measured to determine whether or not hydrodynamic containment is being achieved.

Q Area Drum Storage Yard- Groundwater samples have been collected to obtain a baseline reference of the quality of groundwater at both sites. The data will be used to assess the effectiveness of an air sparge/soil vapor extraction system planned for the site. Geochemical parameters also were analyzed to evaluate the potential for natural attenuation of organic contaminants. Samples will be collected for these same parameters to supplement data previously collected.

3. Organization:

LANTDIV IR Section Head	Nina Johnson
LANTDIV Navy Technical Representative	Randy Jackson
USEPA Remedial Project Manager	Harry Harbold
VDEQ Federal Facilities Project Manager	Devlin Harris
CH2M HILL Activity Manager	Mike Tilchin
Quality Control Senior Review	Doug Dronfield
Technical Project Manager	Bob Root
Field Team Leader	James Hutton

4. Table of samples with analyses performed and to be performed and associated QC samples : See tables QAPP-6 and QAPP-7.

5. Analytical Quantitation Limits:

X As per Table 8-2 of MQAPP _____ Other (attached)

6. QA/QC Acceptance Criteria (e.g., precision, accuracy)

X_____As per Table 4-1 of MQAPP _____Other (attached)

7. Data reduction, validation, and reporting:

X_____As per Section 9 of MQAPP _____Other (attached)

8. Internal QC Procedures (field and laboratory):

X_____As per Section 10 of MQAPP _____Other (attached)

9. Corrective Action:

X_____As per Section 14 of MQAPP _____Other (attached)

10. Other deviations from MQAPP _____

Table QAPP-6
SUMMARY OF AQUEOUS SAMPLES TO BE SUBMITTED FOR ANALYSIS
CAMP ALLEN LANDFILL

Matrix	Laboratory Parameter	Samples	Field Duplicates[1]	Field Blanks[2]	Trip Blanks[3]	MS/ MSDs[4]	Equipment Blanks[5]	Matrix Total[6]
Groundwater	TCL Volatiles (low concentration)	18	2	1	5	1	5	31
	TAL Metals (total)	2	1	1	0	1	1	5
	TAL Metals (dissolved)	2	1	1	0	1	1	5

Notes:
[1]Field duplicates are collected at a frequency of 1 per 10.
[2]Field blanks are collected at a frequency of 1 per source per event.
[3]Trip blanks are shipped with samples submitted for volatiles analysis. Trip blanks are used to monitor contamination that could be introduced during transportation. Trip blanks are collected at a frequency of 1 per cooler of volatiles samples.
[4]Matrix spike/matrix spike duplicates (MS/MSD) are collected at a frequency of 1 per 20. MS/MSDs represent samples for which extra volume must be collected for the laboratory to perform required QC analyses. Triple the normal volumes will be collected for all analyses. MS/MSD is not required for low concentration volatiles.
[5]Equipment blanks are collected at a frequency of 1 every day per matrix.
[6]Matrix spikes are not counted in the totals as they represent extra volume, not extra samples
This table is based on Navy Level D QA/QC requirements.

Table QAPP-7
SUMMARY OF AQUEOUS SAMPLES TO BE SUBMITTED FOR ANALYSIS
Q AREA DRUM STORAGE YARD

Matrix	Laboratory Parameter	Samples	Field Duplicates[1]	Field Blanks[2]	Trip Blanks[3]	Matrix Spikes[4]	Equipment Blanks[5]	Matrix Total[6]
Groundwater	TCL Volatiles	2	1	1	1	1	1	6
	Nitrate/Nitrite, Sulfate, Sulfide, Chloride, and TOC	2	1	1	0	1	1	5

Notes:
[1]Field duplicates are collected at a frequency of 1 per 10.
[2]Field blanks are collected at a frequency of 1 per source per event.
[3]Trip blanks are shipped with samples submitted for volatiles analysis. Trip blanks are used to monitor contamination that could be introduced during transportation. Trip blanks are collected at a frequency of 1 per cooler of volatiles samples.
[4]Matrix spike/matrix spike duplicates (MS/MSD) are collected at a frequency of 1 per 20. MS/MSDs represent samples for which extra volume must be collected for the laboratory to perform required QC analyses. Triple the normal volumes will be collected for all analyses. MS/MSD is not required for low concentration volatiles.
[5]Equipment blanks are collected at a frequency of 1 every day per matrix.
[6]Matrix spikes are not counted in the totals as they represent extra volume, not extra samples

This table is based on Navy Level D QA/QC requirements.

Investigation-Derived Waste Management Plan

This Investigation-Derived Waste Management Plan (IDWMP) documents site-specific procedures and methodologies to be used to handle, manage, and dispose of IDW generated during CTO-45 additional field activities at Naval Base Norfolk (NBN), Norfolk, Virginia. A previous IDWMP dated November 10, 1997, dealt with the handling of IDW from previous activities to date at the site. This IDWMP is written as a supplement to the November 10, 1997, IDWMP and to the NBN Master IDWMP (MIDWMP) contained within the final Master Project Plan (MP) produced by CH2M HILL in October 1997. The MIDWMP should be referenced for information concerning base-wide procedures and methodologies used to handle, manage, and dispose of IDW. The site-specific checklist of information that is specific to CTO-45 and that is not found in the MIDWMP is located at the end of this section.

Site Specific IDW Management Procedures

All IDW will be handled, managed, and disposed of in accordance with the MIDWMP and the appropriate standard operating procedures (SOPs) located in Volume 2 of the MP. All referenced SOPs are listed on the site-specific FSP checklist at the end of the site-specific FSP.

Specifically, IDW management will involve the storage, sampling, transport, and offsite disposal of an estimated 13 cubic yards of IDW soil and the storage, sampling, transport, and offsite disposal of an estimated 1,000 gallons of IDW water. This water and soil will be produced during the installation of monitoring wells and piezometers. The assumption is that none of the soil and water is hazardous.

HANDLING OF IDW SOIL

IDW soil will be stockpiled in a plastic lined roll-off container(s) capable of holding and transporting an estimated 13 cubic yards of IDW soil. The roll-off(s) will be equipped with a durable and tight-fitting tarp capable of keeping rain from entering the container. The roll-off(s) also will be used to dispose of personal protective equipment and sampling materials such as gloves, and other sampling-related trash. The roll-off(s) will be stored at the site for approximately 2 months until all drilling activities are completed and the soil has been characterized with respect to level of hazard. In addition to the roll-off container(s), an estimated 10 DOT-approved 55-gallon steel drums will be used to transport IDW soil around the site for dumping into the roll-off(s).

An estimated two composited samples of the soil will be collected and submitted to an offsite laboratory for analysis for the RCRA hazardous-waste classification analyses, which are defined as:

- TCLP Volatile Organic Compounds
- TCLP Semivolatile Organic Compounds
- TCLP Metals
- TCLP Pesticides
- TCLP Herbicides

- Ignitability
- Corrosivity
- Reactivity

The samples will be analyzed with 21-day turnaround time. Within 14 days of obtaining the results and approval of the results by CH2M HILL and the Navy, the soil will be transported to an approved facility for treatment and/or disposal, as appropriate for the level of hazard posed by the soil.

HANDLING OF IDW WATER

IDW water will be stored in a tank(s) capable of holding approximately 1,000 gallons of IDW water. This tank(s) will remain at the site for approximately 2 months until all drilling activities are completed and the water has been characterized with respect to level of hazard. The tank(s) will be used to dispose of groundwater purged from monitoring wells at the site and water used for the cleaning of drilling equipment. All containers must be clean before transport to the site for IDW containment.

An estimated one composited sample of the water will be collected and submitted to an offsite laboratory for analysis for the RCRA hazardous-waste classification analyses as listed above under HANDLING OF IDW SOIL.

The sample will be analyzed with 21-day turnaround time. Within 14 days of obtaining the results and approval of the results by CH2M HILL and the Navy, the water will be transported to an approved facility for treatment and/or disposal, as appropriate for the level of hazard posed by the water. A vacuum truck will be needed to remove the IDW water from the tank(s) for transport.

TRANSPORT AND DISPOSAL

The CH2M HILL project manager will be responsible for receiving authorization from the Navy Technical Representative to remove the IDW soil and water. The IDW subcontractor will call the CH2M HILL project manager to confirm plans to remove the IDW soil and water and arrange for the activity to sign the manifest authorizing the removal. The subcontractor will provide any manifests necessary to transport the IDW soil and water.

If the analyses show that the water is not hazardous by characteristics, it will be disposed of by the IDW subcontractor using an industrial water treatment plant or other treatment method selected by the subcontractor, provided these methods and practices are consistent with State and Federal disposal regulations. The legal disposal of the IDW water in full compliance with State and Federal regulations is the responsibility of the subcontractor. Non-hazardous soil also will be disposed of in a manner consistent with State and Federal regulations. All disposal methods shall be discussed with and approved by CH2M HILL and the Navy.

If the IDW soil and/or water are found to be hazardous, CH2M HILL will confer with the Navy over handling alternatives while paying daily tank charges to the subcontractor for water storage (if the water is found to be hazardous).

The IDW subcontractor shall notify the CH2M HILL project manager once the IDW soil and water has been properly treated and/or disposed of.

Site-Specific Investigation-Derived Waste Plan Checklist

This checklist supplements the Master IDW Plan with site-specific information. Once completed for a specific project, it provides necessary IDW information for each investigation. It is to be taken into the field with the Master IDW Plan.

Site: Camp Allen Landfill and the Q Area Drum Storage Yard

1. IDW Media:
   - X Soil cuttings
   - X Well development or purge water
   - X Decontamination residual soil and wastewater
   - X PPE or disposable equipment
   - _____ Other _____

2. Expected Regulatory Status:
   - _____ Hazardous
   - X Solid Waste
   - _____ Unknown
   - _____ Other _____

3. Site Location: Camp Allen Landfill and Q Area Drum Storage Yard at Naval Base Norfolk

4. Nature of Contaminants Expected:
   - _____ Petroleum contamination
   - X Polyaromatic hydrocarbon
   - _____ Pesticides
   - _____ Herbicides
   - _____ PCBs
   - X Metals
   - X Other volatile organic compounds

5. Volume of IDW Expected:
   - _____ Drums
   - 13 Cubic Yards
   - _____ Tons
   - 1,000 Gallons

6. Compositing Strategy for Sample Collection: Grab samples from each drum and/or roll-off container combined in a single container

7. IDW Storage
   - X As per Master IDW Plan
   - _____ Other _____

8. Waste Disposal

X_____As per Master IDW Plan _____Other_____

Health and Safety Plan

This Health and Safety Plan (HASP) documents site-specific procedures and methodologies related to maintaining personnel health and safety during CTO-45 additional field activities at Naval Base Norfolk (NBN), Norfolk, Virginia. A previous HASP dated November 10, 1997, dealt with the health and safety during previous activities to date at the site. This HASP is written as an addendum to the November 10, 1997, HASP and to the NBN Master HASP (MHASP) contained within the final Master Project Plan (MP) produced by CH2M HILL in October 1997. The MHASP should be referenced for information concerning base-wide procedures and methodologies regarding health and safety. The site-specific checklist of information that is specific to CTO-45 and that is not found in the MHASP is located at the end of this section.

Site Specific IDW Management Procedures

This amendment must accompany the health and safety plan (HSP) for Long-Term Monitoring Plans at Four Sites (Navy CLEAN CTO 45) approved on July 17, 1997. The purpose of the HSP amendment is to include supplemental information, as it becomes available. Supplemental information is used to reevaluate hazards associated with the planned tasks and to revise protective procedures (e.g., air monitoring). Where the amendment contains information different from the HSP, the amendment will take precedence for the specified task. The amendment includes new information or revises existing HSP information. Sections of the HSP that are not addressed in the amendments do not have changes; therefore, the HSP will be followed. All employees performing tasks covered by this amendment must read both the HSP and this amendment and agree to abide by their provisions by signing the Employee Signoff sheet.

PROJECT INFORMATION AND DESCRIPTION

CLIENT OR OWNER: U.S. Navy

PROJECT NO: 142065.PP.PM

PROJECT MANAGER: Bob Root

OFFICE: WDC

SITE NAME: Naval Base Norfolk

SITE ADDRESS: Norfolk, Virginia

DATE AMENDMENT PREPARED: May 11, 1998

DATE(S) OF SITE WORK: May 11, 1998 – December 31, 1998

2.2 DESCRIPTION OF TASKS (Reference Section 1, "Field Activity Start-up Form," of *Site Safety Notebook*

The following task is in addition to those listed in the CH2M HILL Health and Safety Plan (August 1997).

Direct-Push Borings and Monitoring-Well Installation

- CH2M HILL personnel will supervise a subcontractor performing direct-push borings for the purpose of collecting groundwater samples and a subcontractor for drilling and installing monitoring wells.
- TEG is subcontracted to do the direct-push borings. They are one of the basic order agreement (BOA) subcontractors with approved credentials, unit rates, and health and safety certifications.
- Groundwater Systems is subcontracted for well drilling and installation. They are one of the basic order agreement (BOA) subcontractors with approved credentials, unit rates, and health and safety certifications.

4 PERSONNEL

4.1 CH2M HILL EMPLOYEE MEDICAL SURVEILLANCE AND TRAINING (Reference CH2M HILL SOP HS-01, *Medical Surveillance*, and HS-02, *Health and Safety Training*)

Employee Name	Office	Responsibility	SSC/FA-CPR
Malcolm Garg	WDC	Field team leader and SSC	Level C SSC FA-CPR
James Hutton	WDC	Field team member	Level D SSC FA-CPR
Don Martinson	WDC	Field team member	Level B SSC FA-CPR
Richard Doucette	WDC	Field team member	Level D SSC FA-CPR
Mike Showalter	WDC	Field team member	Level C SSC FA-CPR
Brett Doerr	WDC	Field team member	Level D SSC FA-CPR
Bob Root	WDC	Project Manager	FA-CPR

(a) Team subcontractor under EPA RAC contract. Employee meets the medical monitoring and training requirements of 29 CFR 1910.120 "Hazardous Waste Operations and Emergency Response".

14 APPROVAL

This site safety plan has been written for use by CH2M HILL only. CH2M HILL claims no responsibility for its others unless specified and defined in project or contract documents. The plan is written for the specific site con purposes, dates, and personnel specified and must be amended if those conditions change.

14.1 AMENDMENTS

CHANGES MADE BY:	DATE:
Bob Root	May 11, 1998

CHANGES TO PLAN: Adding personnel (Richard Doucette) and drilling subcontractor (Groundwater Syster updating dates of activities

AMENDMENT APPROVED BY:	DATE:
Jim Bushnell	May 14, 1998